



Monticello, Utah, Disposal and Processing Sites

FACT SHEET

This fact sheet provides information about the Monticello, Utah, Disposal and Processing Sites. These sites are managed by the U.S. Department of Energy Office of Legacy Management.

Site Descriptions and History

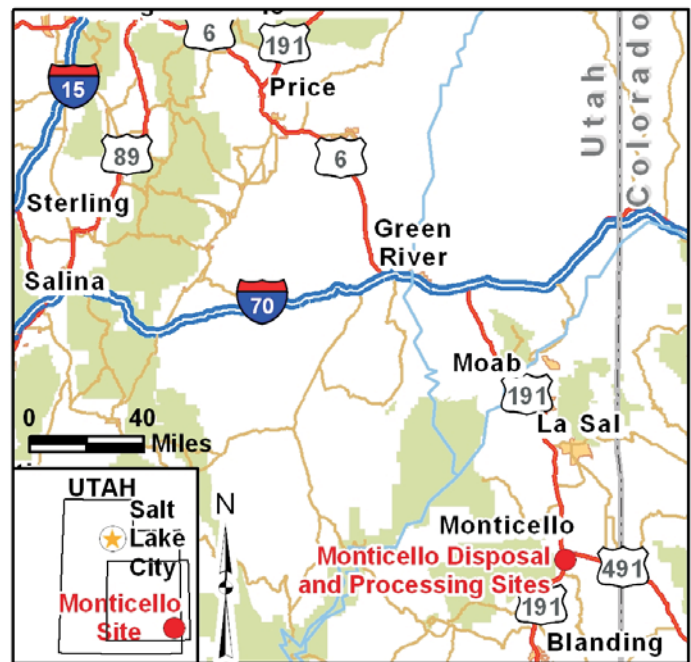
The Monticello, Utah, Disposal and Processing sites are located in and near the city of Monticello, Utah, in southeastern Utah about 250 miles southeast of Salt Lake City, Utah. The 2000 census population of Monticello was about 1,900.

In 1942, the Defense Plant Corporation constructed the Monticello mill at a former uranium and vanadium ore-buying station, which had been constructed in 1940. The purpose of the mill was to produce vanadium and uranium for military purposes. Various government agencies operated the mill until 1948, when it was obtained by the U.S. Atomic Energy Commission, a predecessor agency of the U.S. Department of Energy (DOE). Milling operations were terminated on January 1, 1960.

During its years of operation, the mill processed approximately 900,000 tons of ore. The mill tailings, a predominantly sandy residue containing low levels of radionuclides and metals that remained after the ore was processed, were locally impounded in piles at four locations adjacent to Montezuma Creek near the mill. Tailings carried by wind or Montezuma Creek spread contamination to nearby properties. Throughout the operating period, mill tailings were commonly used in Monticello as fill for open lands; as backfill around water, sewer, and electrical lines; as base for driveways, sidewalks, and concrete slabs; as backfill against basement foundations; and as sand mix in concrete, plaster, and mortar.

Between 1961 and 1965, various measures were taken to dismantle the mill, dispose of equipment and scrap, bury contaminated materials, grade and cover the impounded tailings and other contaminated materials with soil, and revegetate the site. In 1974 and 1975, mill foundations were demolished and buried, and the area was graded and revegetated. A fence was constructed around the mill site to prevent public access to contaminated materials.

The U.S. Atomic Energy Commission began radiological surveys throughout the city of Monticello in 1971 to



M:\LT\S\111\0038\01\S03992\S0399200.mxd carverh 2/6/2008 9:13:05 AM

Location of the Monticello, Utah, Disposal and Processing Sites

identify the nature and extent of mill-related radiological contamination. In 1980, the Monticello mill site was accepted into the newly established Surplus Facilities Management Program for remedial action, and the Monticello Remedial Action Project was established to conduct the remedial action.

In 1983, remedial activities for the tailings-contaminated private and publicly owned properties in and around the city of Monticello, known as vicinity properties, were separated from the Monticello Remedial Action Project with the establishment of the Monticello Vicinity Properties (MVP) and the Monticello Mill Tailings Site (MMTS). The MVP and MMTS were later placed on the National Priorities List (NPL) pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also known as Superfund) and the Superfund Amendments and Reauthorization Act.

Monticello Vicinity Properties

Cleanup of the MVP consisted of excavating tailings, ore, and related by-product material from vicinity properties; temporary storage on the Monticello mill site; and final disposal in a repository to be constructed for materials from the Monticello mill site. Because mill tailings from the Monticello mill site were used for construction, cleanup included demolition of contaminated sidewalks, patios, sheds, and other improvements. Affected properties were backfilled, graded, and reconstructed. Approximately 150,000 cubic yards of contaminated materials were temporarily placed on the mill site and ultimately disposed of with contaminated mill site material. Cleanup of the MVP was completed in June 1999.

A total of 424 properties were ultimately remediated under the MVP project. The MVP site was deleted from the NPL on February 28, 2000.

Monticello Mill Tailings Site

Remediation of the MMTS was administratively divided into two areas of remedial action, known as operable units (OUs): OU I comprised the former mill site and tailings impoundment areas, and OU II comprised the 34 properties peripheral to the mill site. A third operable unit—OU III, surface water and groundwater—was added later.

OU I, Monticello Millsite Tailings and Millsite Property—OU I consists of the 78-acre former mill site, tailings impoundment areas on the mill site, and storage areas on the mill-site property that were used to store tailings-contaminated materials removed from the vicinity properties and peripheral properties. Construction of a permanent, on-site disposal cell and its leachate collection system is also included in this OU. Components of the OU I cleanup remedy include relocating contaminated materials from the mill site to the disposal cell, revegetation after removal of the tailings, realignment of Montezuma Creek, and reestablishment of wetland areas.

OU II, Peripheral Properties—OU II consists of 33 private properties and one former DOE-owned property peripheral to the mill site that were contaminated by windblown tailings and by soil and sediment transported downstream of the mill site and deposited in and adjacent to Montezuma Creek. Twenty-two peripheral properties, consisting of properties that were not affected by contaminated surface water and groundwater, were deleted from the NPL in October 2003. Deletion of the remaining peripheral properties from the NPL is dependent on meeting the remediation goals for OU III surface water and groundwater.

In 2000 DOE transferred about 380 acres of land that included the former mill site property and several peripheral properties to the City of Monticello through

the Federal Land to Parks Program for use in perpetuity as public parks and recreation.

OU III, Surface Water and Groundwater—OU III was designated when DOE, with concurrence of the U.S. Environmental Protection Agency (EPA) and the Utah Department of Environmental Quality, determined that selection of a final remedy for surface water and groundwater should be deferred until surface remedial actions were completed at the mill site. A plume of contaminated groundwater in a shallow alluvial aquifer extends from the former source area on the mill site to about 1 mile east. The primary groundwater contaminant is uranium. Surface water contamination was reduced significantly after source removal.

In May 2004, monitored natural attenuation with institutional controls was selected as the remedy for OU III. Under this remedy, contamination is allowed to dissipate by natural processes in the aquifer, and domestic use of the water is prohibited through the State Engineer. DOE conducts compliance monitoring to track the progress of this remedy.

To evaluate groundwater treatment technology, DOE installed and operates in situ passive and ex situ active treatment systems using zero-valent iron as the treatment medium. The in situ system, known as a permeable reactive barrier, uses zero-valent iron placed in the subsurface to remove contaminants from groundwater flowing through the barrier. This method is highly efficient in removing contaminants but is susceptible to mineral precipitation within the barrier. The ex situ systems use extraction wells to pump groundwater through aboveground reactor vessels containing zero-valent iron. The permeable reactive barrier was installed in June 1999. The ex situ system was installed in June 2005, and a second system was installed in March 2007.

Supplemental Standards Properties

Regulations in Title 40 *Code of Federal Regulations* (CFR) Part 192.21 allow contaminated material to be left in place in certain cases if attaining cleanup standards will cause excessive risk of injury, excessive environmental harm, or unreasonably high costs compared with the health benefits to be gained. The site-specific remediation standards, called supplemental standards, have been applied at 11 privately owned and City-owned properties in Monticello, city streets and utilities rights of way, and Utah Department of Transportation Highways 191 and 491 rights of way within the city.

Disposal Site

The surface of the disposal cell covers approximately 90 acres; a clean-fill berm and runoff collection ditches define its perimeter. The disposal cell is constructed of a 5.5-foot-thick, fine-textured soil layer (sponge layer)

overlying a 12-inch-thick sand-and gravel capillary barrier. A gravel admixture in the upper 8 inches controls erosion and, functioning as a mulch, enhances seedling emergence and plant growth. Within the sponge layer is a layer of cobble-sized rocks (i.e., rocks with diameters between 2.5 and 10 inches) about 1 foot above the capillary barrier that provides an added deterrent to deeper burrowers such as prairie dogs. Fine-textured soil fills the interstices of the cobble layer. The topsoil layer has physical and hydraulic properties similar to those of the soil sponge and is capable of sustaining a diverse plant community. This “water balance” cover is underlain by a high-density polyethylene liner and functions by temporarily storing precipitation in the sponge layer during periods of plant dormancy. Moisture is removed by evapotranspiration during the growing season.

The disposal cell is divided into two separate cells, east and west, each with an independent leachate collection and removal system (LCRS) and an underlying leak detection system (LDS) for collecting liquids that drain from the encapsulated material.

A double-walled leachate transmission pipeline extends from the disposal cell LCRS and LDS to Pond 4, located just east of the disposal cell. Residual water present in the tailings when the material was originally placed in

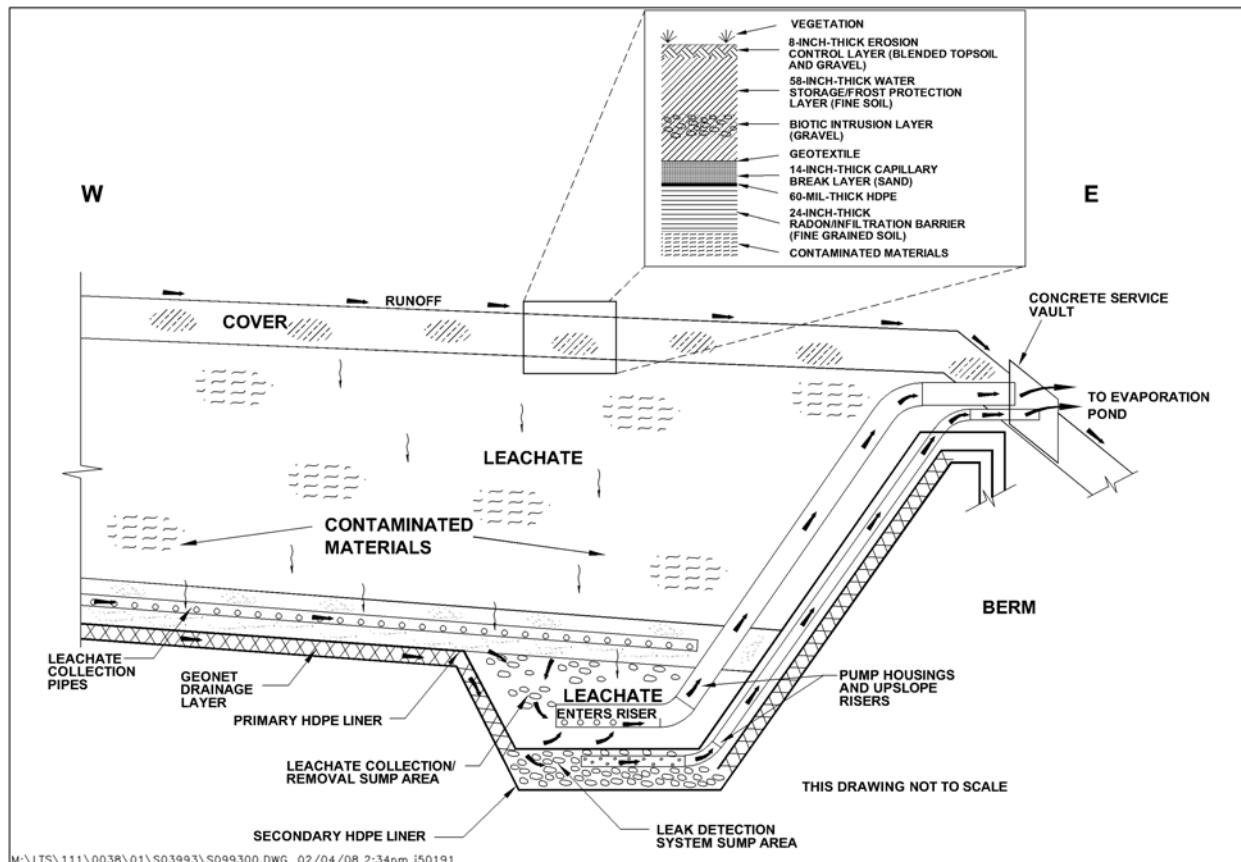
the disposal cell and water added during placement of the tailings is expected to drain for as long as 20 years from the time of final tailings encapsulation in 1999. Pond 4 serves as a containment and evaporation pond for that water. Pond 4 is also equipped with an LCRS and LDS. The operating capacity of Pond 4 is 16 million gallons. Measurements of water infiltration using a 7.5-acre embedded drainage lysimeter indicate that infiltration through the sponge layer of the cover to date has been negligible.

The disposal cell and Pond 4 LCRS and LDS include automated controls, sensors, and communication devices to monitor water levels in the sumps, operate the pumps, and transmit the monitoring and pumping information to a computer database maintained at DOE's Office of Legacy Management in Grand Junction, Colorado. These hardware and software components allow remote operation capabilities and viewing of the monitoring data in real time or historically.

Regulatory Setting

Disposal Cell

The disposal cell contents are not regulated under the Resource Conservation and Recovery Act (RCRA), but RCRA post-closure disposal cell monitoring



Cross Section of the Monticello Site Disposal Cell

and maintenance requirements are applicable.

The RCRA groundwater protection standard (40 CFR 264 Subpart F) sets forth the general groundwater monitoring requirements for the disposal cell.

In accordance with 40 CFR 192.32, the disposal cell is designed to be effective for 1,000 years, to the extent reasonably achievable, and, in any case, for at least 200 years. However, the general license has no expiration date, and DOE's responsibility for the safety and integrity of the Monticello disposal cell will last indefinitely.

Soil

Soil was generally cleaned up to standards in 40 CFR 192. Though this regulation is not strictly applicable to Monticello, the Monticello site was sufficiently similar to the applicable sites that the same criteria were considered relevant and appropriate.

Surface Water and Groundwater

Monitored natural attenuation was projected to restore surface water and groundwater to acceptable levels by 2045. A 2004 Record of Decision for OU III included the requirement of groundwater monitoring to measure the progress of water quality restoration. The Record of Decision also required the continued enforcement of institutional controls that prevent use of the contaminated groundwater. The applicable requirements for contaminated surface water and groundwater at the Monticello Millsite are Utah water quality standards, groundwater standards in 40 CFR 192, and the maximum contaminant levels defined in the Safe Drinking Water Act. A site-specific risk assessment was used to establish the standards for OU III contaminants of concern not covered by these state and federal standards. DOE is currently evaluating potential contingency actions for the OU III remedy.

CERCLA 5-Year Reviews

Section 121(c) of CERCLA requires that remedial actions resulting in any hazardous substances, pollutants, or contaminants remaining at a site above levels that allow for unlimited use and unrestricted exposure be reviewed every 5 years to ensure protection of human health and the environment. Therefore, CERCLA 5-year reviews are required by statute for the MVP site and the MMTS. The cycle of CERCLA 5-year reviews of the MMTS and MVP began in 1997. The third 5-year reviews were completed in June 2007. These most recent reviews concluded that

the remedies are protective of human health at all Monticello sites and are protective of the environment at all sites except OU III, where DOE is currently evaluating potential ecological risk from selenium in wetland habitat.

Institutional Controls

Institutional controls in effect at the Monticello NPL sites limit the use of land and groundwater on certain properties where contaminated soil was left in place pursuant to supplemental standards or was underlain by contaminated groundwater. The five categories of institutional control applied to the Monticello NPL sites are (1) restrictive easements on City-owned property transferred from DOE, (2) radiological control at public road and utility excavations, (3) zoning restrictions, (4) restrictive easements on privately owned property, and (5) a groundwater restricted area.

Legacy Management Activities

The encapsulated materials in the disposal cell will remain potentially hazardous for thousands of years. DOE manages the disposal site according to a site-specific Long-Term Surveillance and Maintenance Plan to ensure that the disposal cell systems continue to prevent release of contaminants to the environment. Under provisions of this plan, DOE conducts annual inspections of the site to evaluate the condition of surface features, performs site maintenance as necessary, and monitors ground water to verify the continued integrity of the disposal cell. The annual site inspections will also be used as the basis for the CERCLA 5-year reviews.

Contacts

Documents related to the Monticello site are available on the DOE Legacy Management website at <http://www.LM.doe.gov/land/sites/ut/monticello/monticello.htm>

For more information about DOE Legacy Management activities at the Monticello site, contact

U.S. Department of Energy
Office of Legacy Management
2597 B3/4 Road, Grand Junction, CO 81503
(970) 248-6070 (monitored continuously), or
(877) 695-5322 (toll-free)